REMARKS

Claims 1, 3-7, and 10-12 remain in this application. Claims 2 and 8-9 have been canceled. Claim 1 has been amended to incorporate the features of claim 2. Claims 10 and 11 have been amended to depend from a non-canceled claim. No new matter has been added.

At page 2, item 2, the Office Action rejects claims 1-7, and 10-12 under 35 USC 103(a) as obvious over RUSINKO et al. (7,319,079) further in view of ROCHE et al. (3,256,103). Applicants respectfully traverse the rejection.

Currently amended claim 1 is directed to a ceramics sintered body comprising boron nitride, titanium diboride, a calcium compound and titanium nitride and having a relative density of 92% or more, wherein the content of the calcium compound in terms of CaO is from 0.05 to 0.8% by weight, a part or all of the titanium nitride exists in a grain boundary phase, and a peak intensity by X-ray diffraction of the (200) plane derived from titanium nitride is from 0.06 to 0.15 relative to a peak intensity of the (002) plane of boron nitride. RUSINKO and/or ROCHE fail to teach or suggest such a sintered body.

The instant specification describes, for example at page 3, that when a mixed raw material powder containing a specific low crystalline boron nitride (BN) powder is used and sintered while crystallizing it, titanium nitride exists in a grain boundary phase of the resulting sintered body to provide a grain boundary phase different from a conventional grain boundary phase. A conventional grain boundary phase is amorphous and has

a large amount of oxygen with which the progress of corrosion is accelerated. As further described, for example at page 7, titanium nitride is a component for imparting corrosion resistance to the ceramics sintered body, and in the present invention, corrosion resistance is improved by titanium nitride (TiN) that exists at least in part in the grain boundary phase. The existence of TiN in the grain boundary phase can be confirmed by using the state of element distribution by an EPMA (X-ray microanalyzer) at a cross-sectional ground portion in combination with a powder X-ray diffraction method. The peak intensity by X-ray diffraction of the (200) plane derived from TiN is adjusted to a ratio of 0.06 to 0.15 relative to the peak intensity of the (002) plane of BN. The reason why the corrosion resistance of the ceramics sintered body is improved by allowing TiN to exist in the grain boundary phase is because the affinity of TiN for a molten metal is smaller than that of the other constituents (B_2O_3, TiO_2 and Al_2O_3) of the grain boundary phase.

RUSINKO and/or ROCHE fail to teach or suggest a ceramics sintered body that includes titanium nitride in a grain boundary phase. RUSINKO and/or ROCHE also fail to teach or suggest a ceramics sintered body that comprises titanium nitride and boron nitride wherein a peak intensity by X-ray diffraction of the (200) plane derived from titanium nitride is from 0.06 to 0.15 relative to a peak intensity of the (002) plane of boron nitride, as recited in currently amended claim 1. For at least these reasons, RUSINKO and/or ROCHE, alone or in combination, fail to teach or suggest, and would not have rendered obvious, a ceramics sintered body having all of the features recited in

claim 1. Claims 3-7 and 10-12 depend directly or indirectly from claim 1 and for at least the same reasons would also have not been obvious. Accordingly, applicants respectfully request reconsideration and withdrawal of the rejection.

Claims 4 and 11 depend directly or indirectly from claim 1 and further recite that the boron nitride crystal contained in the ceramics sintered body has a C-axis lattice constant of 6.675 angstroms or less, and the ceramics sintered body has an oxygen amount of from 1 to 2% by weight. As described in the instant specification, for example at pages 8-9, satisfying these conditions of oxygen amount and C-axis lattice constant further improves the corrosion resistance of a ceramics sintered body. When the C-axis lattice constant becomes larger than 6.675 angstroms, boron nitride has a low crystallinity and a large crystal strain; thus, the ceramic becomes more susceptible to corrosion due to the molten metal. A boron nitride grain low in crystallinity contains solid solution oxygen and stacking fault in large amounts, and such structural defects in the grain become starting points of corrosion due to the molten metal. Higher crystallinity provides stronger corrosion resistance.

RUSINKO and/or ROCHE fail to teach or suggest a ceramics sintered body featuring this aspect of a C-axis lattice and/or oxygen amount. For this additional reason, RUSINKO and/or ROCHE fail to teach or suggest, and would not have rendered obvious, claims 4 and 11. Accordingly, applicants respectfully request reconsideration and withdrawal of this aspect of the rejection.

At page 3, item 3, the Office Action rejects claims 1-7, and 10-12 under 35 USC 103(a) as obvious over JUNGLING (6,466,738) alone or further in view of ROCHE. Applicants respectfully traverse this rejection.

As detailed in the comments above, claim 1 is directed to a ceramics sintered body comprising boron nitride, titanium diboride, a calcium compound and titanium nitride and having a relative density of 92% or more, wherein the content of the calcium compound in terms of CaO is from 0.05 to 0.8% by weight, a part or all of the titanium nitride exists in a grain boundary phase, and a peak intensity by X-ray diffraction of the (200) plane derived from titanium nitride is from 0.06 to 0.15 relative to a peak intensity of the (002) plane of boron nitride. For at least the same reasons as detailed above, JUNGLING and/or ROCHE also fail to teach or suggest such a ceramics sintered body.

JUNGLING and/or ROCHE fail to teach or suggest a ceramics sintered body wherein a part or all of the titanium nitride exists in a grain boundary phase, as recited in currently amended claim 1. JUNGLING and ROCHE also fail to teach or suggest a peak intensity by X-ray diffraction of the (200) plane derived from titanium nitride is from 0.06 to 0.15 relative to a peak intensity of the (002) plane of BN, as recited in claim 1. For all of these reasons, JUNGLING and/or ROCHE, alone or in combination, fail to teach or suggest, and would not have rendered obvious, a ceramics sintered body having all of the features recited in claim 1. Accordingly, applicants respectfully request reconsideration and withdrawal of the rejection.

Regarding claims 4 and 11, JUNGLING and ROCHE also fail to teach or suggest a ceramics sintered body wherein the boron nitride crystal contained in the ceramics sintered body has a C-axis lattice constant of 6.675 angstroms or less, and the ceramics sintered body has an oxygen amount of from 1 to 2% by weight, as featured in claims 4 and 11. For at least this additional reason, JUNGLING and/or ROCHE fail to teach or suggest, and would not have rendered obvious, claims 4 and 11. Applicants respectfully request reconsideration and withdrawal of this aspect of the rejection.

Entry of the above amendments is earnestly solicited and applicants respectfully request that a timely Notice of Allowance be issued in this case.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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